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| 10/811,600 | 03/29/2004 | Ki-Cheol Lee | 5000-1-551 | 2660 |

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| EXAMINER | |
|---|---|
| LE, THI Q | |

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/811,600 | LEE ET AL. | |
| | Examiner | Art Unit | |
| | Thi Q. Le | 2613 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *16 March 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,5,9,11-13,15,16 and 19-21* is/are rejected.

7)☒ Claim(s) *2,4,6-8,10,14,17 and 18* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/18/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Priority*

1. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d).

### *Information Disclosure Statement*

2. The information disclosure statement (IDS) filed on 11/02/2006 and 12/18/2006 were considered by the examiner.

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. **Claims 1, 3, 5 and 20** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Blahut (US Patent # 6,778,550)** and in view of **Koh et al. (US PGPub 2004/0022536)** and further in view of **Suzuki et al. (US PGPub 2005/0259541)**.

**Consider claim 1**, Blahut clearly shows and disclose, a passive optical network comprising: an OLT (Optical Line Terminal) (read as, OLT, 113; figure 1) configured to perform; frame-multiplexing on the broadcast/image signal and communication data received through an IP (Internet Protocol) network into a single frame (read as, the frame generator 404 combines the SONET signals into frames; figure 4); and to electro-optically convert the single frame and transmit the electro-optically converted signal (read as, a laser 407 converts the electrical signal into optical signal; figure 4) (abstract; figure 1, 2 and 4; column 5 lines 17-36; column 9 lines 14-49). A plurality of ONTs (Optical Network Terminals) (read as, ONU 106; figure 1), each ONT adapted to receive an optical signal from the OLT, the ONT configured to photoelectrically convert the received optical signal (read as, photodiode 504 for receiving optical signal and converting it to electrical signal; figure 5), to perform a frame & time slot demultiplexing on the photoelectrically converted signal, to output the communication data and

the broadcast/image data included in the photoelectrically converted signal to a corresponding user (read as,, frame detection 505, within a particular ONU, separates the ATM cells that belong to that ONU; figure 5; column 11 lines 44-67) (figures 1 and 5; column 11 line 31 – column 12 line 13); and an optical splitter (read as, splitter 104; figure 1) arranged in a path between the OLT and the plurality of ONTs, said optical splitter splitting a signal from the OLT into the plurality of ONTs, coupling signals from the plurality of ONTs, and transmitting the coupled signal to the OLT (read as, splitter 104 performs splitting/combining of downstream and upstream signals; figure 1).

Blahut fails to disclose, the OLT performs a switching operation on a plurality of digital broadcast/image data received from an external broadcast provider according to respective broadcast/image selection information transmitted from users, and time division multiplexing on the digital broadcast/image data to convert the digital broadcast/image data into a broadcast/image signal; the ONT performing time-slot demultiplexing on the converted input signal to output entire received communication signals and broadcast/image information included in a time-slot assigned to the ONT to a corresponding user; and wherein the ONT receives a communication signal and the broadcast/image selection information from one of the users to output them to the OLT.

In related art, Koh et al. disclose, the OLT time division multiplexing on the digital broadcast/image data to convert the digital broadcast/image data into a broadcast/image signal (read as, multiplexer 430, time multiplexes the digital broadcast signal from antenna 310; figure 4; paragraph 0042); the ONT performing time-slot demultiplexing on the converted input signal to output entire received communication signals and broadcast/image information included in a

time-slot assigned to the ONT to a corresponding user (read as, the multiplexer 530, time demultiplexes the TDM broadcast signal; figure 5; paragraph 0047); and the ONT receives a communication signal and the broadcast/image selection information from one the users to output them to the OLT (read as, the set top box 600 send control/communication signal to the ONU 500 and the ONU forward the signal to the OLT 400; figures 4-6; paragraph 0051) (note, Koh disclose channel selection performed at the ONU).

It would have been obvious for a person of ordinary skill in the art at the time of the invention to incorporate the teachings of Koh et al. with Blahut. Because the unified broadcast/communication passive optical network system provides efficient services; also bandwidth efficiency is achieved because a subscriber may select a desired broadcast channel using a controller.

In related art, Suzuki et al. disclose a PON wherein, the OLT (read as, central station 100; figure 1, paragraph 0053) performs a switching operation (read as, channel selection; paragraph 0057) on a plurality of digital broadcast/image data received from an external broadcast provider according to respective broadcast/image selection information transmitted from users (read as, central station 100 performs channel selection on a plurality of information supply sources 4-1 to 4-m according to the selection information sent from end user 300-1 to 300-n; paragraphs 0033, 0060, 0067); and within the ONT receives the broadcast/image selection information from one of the users to output them to the OLT (read as, local equipment 200 receives channel selection information from end user 300-1 to 300-n and sends them to central station 100; figure 1, paragraph 0067).

It would have been obvious for a person of ordinary skill in the art at the time of the invention to incorporate the teachings of Suzuki et al. with Blahut. Since the serviceability to user stations can be improved because channel-selection information is transmitted to a central station)

**Consider claim 3, and as applied to claim 1 above**, Blahut as modified by Koh et al. and further modified by Suzuki et al. further disclose, each of the plurality of ONTs includes: a second optical receiver (read as, photodiode 504; Blahut, figure 5) configured to receive the signal transmitted as the optical signal of $\lambda_{DOWN}$ from the OLT, and photoelectrically converting the optical signal (column 1 lines 32-67); a second optical transmitter (read as, laser 517; Blahut, figure 5) configured to electro-optically converting upstream data and transmitting the upstream data to the OLT (column 12 lines 55-57); a frame/time-slot demultiplexer (read as, frame detector and filtering 505; Blahut, figure 5) configured to separate the frame/time-slot-multiplexed broadcast/image and communication signals (column 11 lines 32-67); an Ethernet-PON ONT function processor (read as, microprocessor controller 513; Blahut, figure 5) configured to receive the communication signal from the frame/time-slot demultiplexer, and performing ONT functions on the function processor (column 12 lines 14-27); and a broadcast/image adapter (read as, MPEG decoder inside of video interface 508; Blahut, figure 5) configured to recover a time-slot-format broadcast/image signal, separated by the frame/time-slot demultiplexer into an original signal (column 11 lines 60-63).

**Consider claim 5, and as applied to claim 1 above**, Blahut as modified by Koh et al. and further modified by Suzuki et al. further disclose, the single frame obtained by multiplexing the broadcast/image signal and the communication signal (read as, frame output from frame

generator 404; Blahut, figure 4) is divided into a predetermined number of time-slots (read as, a subset of ATM cells belonging to a particular ONU 106; Blahut, column 11 line 54), and each of the time-slots includes a broadcast/image sub-time-slot (read as, particular cell within the subset of ATM cells; Blahut, column 11 lines 53-66) containing a broadcast/image signal (read as, ATM cell containing video data; Blahut) and an Ethernet sub-time-slot containing a communication signal (read as, ATM cell containing internet data; Blahut) (Blahut; figure 5; column 11 lines 53-66).

**Consider claim 20, and as applied to claim 1 above**, Blahut as modified by Koh et al. and further modified by Suzuki et al. further disclose, wherein the switching operation, which the OLT is configured to perform, comprises selecting a broadcast/image data channels from a plurality of broadcast/image channels, which received from an external broadcast provider, according to the broadcast/image selection information transmitted from each user (Suzuki disclosed the central station 100 performs channel selection based on the user selections, paragraph 0060; further, Koh disclosed, the controller 550 of the ONU performs channel selection based on the control signal received by the end user; paragraphs 0049).

7. **Claims 9 and 12** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Blahut (US Patent # 6,778,550)** and in view of **Koh et al. (US PGPub 2004/0022536)** and further in view of **Suzuki et al. (US PGPub 2005/0259541)** and further in view of **Hou et al. (US Patent # 6,324,184)**.

**Consider claim 9, and as applied to claim 1 above**, Blahut as modified by Koh et al. and further modified by Suzuki et al. disclosed the invention as described above and sub-frame (read as, a subset of ATM cells belonging to a particular ONU 106; Blahut, column 11 line 54)

for broadcast/image signals, and a sub-frame for Ethernet communication signals (read as, ATM cells containing internet data and containing video data; Blahut), the sub-frame for broadcast/image signals including broadcast/image time-slots containing broadcast/image signals of the ONTs (read as, ATM cell containing video data; Blahut); but except for, the single frame obtained by multiplexing the broadcast/image signal and the communication signal is divided into a sub-frames, and the sub-frame includes time-slots that contain signals of the ONTs.

In related art, Hou et al. disclose, the single frame (read as, super frame 310; figure 3) obtained by multiplexing the broadcast/image signal and the communication signal is divided into a sub-frame (read as, frame 320; figure 3) for broadcast/image signals and a sub-frame for Ethernet communication signals (read as, frame 330; figure 3), and the sub-frame includes time-slots (read as, slot 332-328; figure 3), respectively, for containing signals of the ONTs (column 4 lines 20-39).

It would have been obvious for a person of ordinary skill in the art at the time of the invention to incorporate the teachings of Hou et al. with Blahut as modified by Koh et al. Since Hou et al. shows in details, the general framing structure of a transport stream with in a TDM passive optical network.

**Consider claim 12, and as applied to claim 9 above**, Blahut as modified by Koh et al. and Suzuki et al. and further modified by Hou et al. further disclose, the sub-frame for Ethernet communication signals (read as, ATM cells containing internet data; Blahut) contains communication data of every ONT (note, Blahut disclosed, an ATM cell can be broadcast to all ONU, it is obvious that said ATM cell, contains data for all ONU) (Blahut; figure 5; column 11 lines 51-55).

8. **Claim 11** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Blahut (US Patent # 6,778,550)** and in view of **Koh et al. (US PGPub 2004/0022536)** and further in view of **Suzuki et al. (US PGPub 2005/0259541)** and further in view of **Hou et al. (US Patent # 6,324,184)** and in further view of **Wright et al. (US Patent # 6,411,410)**.

**Consider claim 11, and as applied to claim 9 above**, Blahut as modified by Koh et al. and Suzuki et al. and further modified by Hou et al. disclosed the broadcast/image time-slot contains a broadcast/image signal selected by one of the ONTs corresponding to said time-slot's order (read as, the set top box send a channel selection signal to the ONU and OLT, then the ONU sends the optical signal to the set top box with the requested channel modulated with TDM; Koh et al., abstract and paragraph 0059) and the invention as described above; except for, a time-slot is being left empty if there is no broadcast/image signal selected by the ONT.

In related art, Wright et al. disclose, an optical passive network using TDM transport scheme to delivers data from an OLT 12 to a plurality of ONU 14, figure 1. Wherein, the TDM signal comprises of multiple timeslots assigned to different ONU 14, figure 4; and a time-slot is left empty (read as, empty cells labeled E; figure 4) if there is no broadcast/image signal selected by the ONT (column 8 lines 1-5).

It would have been obvious for a person of ordinary skill in the art at the time of the invention to incorporate the teachings of Wright et al. with Blahut as modified by Koh et al. and further modified by Hou et al. So that successive TDM optical signals belonging to different ONU can be kept synchronized.

9. **Claims 13, 15 and 21** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Koh et al. (US PGPub 2004/0022536)** and in view of **Blahut (US Patent # 6,778,550)** and further in view of **Suzuki et al. (US PGPub 2005/0259541)**.

**Consider claim 13**, Koh et al. clearly show and disclose, an optical passive network comprising: an OLT configured to perform time division multiplexing on the digital broadcast/image data to convert the digital broadcast/image data into a broadcast/image signal (read as, multiplexer 430, time multiplexes the digital broadcast signal from antenna 310; figure 4; paragraph 0042), to electro-optically convert the broadcast/image signal into a broadcast/image optical signal of $\lambda_B$ (read as, the optical transmitter 462 convert the electrical signal into optical signal; figure 4), to electro-optically convert communication data received from an IP network into a communication optical signal of $\lambda_{DOWN}$ (read as, the optical transmitter 464 convert the electrical signal into optical signal; figure 4), to couple the broadcast/image optical signal of $\lambda_B$ and the communication optical signal of $\lambda_{DOWN}$ into a single optical signal (read as, the wavelength multiplexer 470; figure 4), and to transmit the single optical signal; a plurality of ONTs (read as, ONU 500; figure 3), each ONT configured to receive an optical signal from the OLT, to separate the received optical signal into the broadcast/image optical signal of $\lambda_B$ and the communication optical signal of $\lambda_{DOWN}$ (read as, the wavelength demultiplexer 510 separates the two wavelengths; figure 5), to photoelectrically convert the two separated signals (read as, optical receivers 522 and 524 convert the optical signal into electrical signal; figure 5), to perform time division demultiplexing on the photoelectrically converted broadcast/image signal to convert the photoelectrically converted broadcast/image signal into the broadcast/image data (read as, the multiplexer 530, time demultiplexes the TDM broadcast

signal; figure 5; paragraph 0047), to output the broadcast/image data and the photoelectrically converted communication signal to a corresponding user (read as, the ONU 500 outputs the signal to corresponding set top box 600; figure 5 and 6), and to receive a communication signal and the broadcast/image selection information from the user to output them to the OLT (read as, the user send control and communication signal to the ONU and OLT; paragraph 0051).

Koh et al. fail to disclose, an OLT for performing switching operation on a plurality of digital broadcast/image data received from an external broadcast provider according to broadcast/image selection information transmitted from users; and an optical splitter configured to split a signal from the OLT into the plurality of ONTs, coupling signals from the plurality of ONTs, and transmitting the coupled signal to the OLT.

In related art, Blahut discloses, an optical splitter (read as, splitter 104; figure 1) for splitting a signal from the OLT into the plurality of ONTs, coupling signals from the plurality of ONTs, and transmitting the coupled signal to the OLT (read as, splitter 104 performs splitting/combining of downstream and upstream signals; figure 1) (figures 1 and 2; column 3 lines 60-67 and column 5 lines 30-35).

It would have been obvious for a person of ordinary skill in the art at the time of the invention to incorporate the teachings of Blahut with Koh et al. Since, Blahut disclose the method for increasing bandwidth efficiency by allowing for flexible bandwidth allocation.

In related art, Suzuki et al. disclose a PON wherein, the OLT (read as, central station 100; figure 1, paragraph 0053) performs a switching operation (read as, channel selection; paragraph 0057) on a plurality of digital broadcast/image data received from an external broadcast provider according to respective broadcast/image selection information transmitted from users (read as,

central station 100 performs channel selection on a plurality of information supply sources 4-1 to 4-m according to the selection information sent from end user 300-1 to 300-n; paragraphs 0033, 0060, 0067).

It would have been obvious for a person of ordinary skill in the art at the time of the invention to incorporate the teachings of Suzuki et al. with Koh et al. Since the serviceability to user stations can be improved because channel-selection information is transmitted to a central station)

**Consider claim 15, and as applied to claim 9 above**, Koh et al. as modified by Blahut and further modified by Suzuki et al. further disclose, each of the plurality of ONTs (read as, ONU 500; figure 3, Koh et al.) (note, all of the cited quotations in this paragraph are from Koh et al.) includes: a second WDM coupler (read as, wavelength demultiplexer 510; figure 5; paragraph 0044) configured to separate an optical signal received from the OLT into a communication signal of $\lambda_{DOWN}$ (read as, signal input to converter 524; figure 5) and a broadcast/image signal of $\lambda_B$ (read as, signal input to converter 522; figure 3); a second optical receiver configured to receive the separated communication signal of $\lambda_{DOWN}$ (read as, converter 524; figure 3, paragraph 0046) and converting the communication signal into an electrical signal; a third optical receiver configured to receive the separated broadcast/image signal of $\lambda_B$ (read as, converter 522; figure 3, paragraph 0046), and converting the separated broadcast/image signal into an electrical signal; an Ethernet-PON ONT function processor (read as, controller 550; figure 3, paragraph 0049), connected to the second optical receiver, configured to perform ONT functions; a third optical transmitter (read as, transmitter 584; figure 3, paragraph 0051) configured to receive broadcast/image selection information and a communication signal to be

transmitted to the OLT from a corresponding user through the Ethernet-PON ONT function processor, and transmitting them as an optical signal sup; and a time division demultiplexer & broadcast/image adapter (read as, format converter 540; figure 5, paragraph 0049) configured to receive the broadcast/image signal converted into the electrical signal, performing time division demultiplexing on the received signal, and recovering a time-slot-format broadcast/image signal, obtained through the time division demultiplexing, into an original signal (note, all of the cited quotation are from Koh et al., figure 5; paragraphs 0044-0051).

**Consider claim 21, and as applied to claim 13 above**, Koh et al. as modified by Blahut and further modified by Suzuki et al. further disclose, wherein the switching operation, which the OLT is configured to perform, comprises selecting a broadcast/image data channels from a plurality of broadcast/image channels, which received from an external broadcast provider, according to the broadcast/image selection information transmitted from each user (Suzuki disclosed the central station 100 performs channel selection based on the user selections, paragraph 0060; further, Koh disclosed, the controller 550 of the ONU performs channel selection based on the control signal received by the end user; paragraphs 0049).

10. **Claim 16** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Koh et al. (US PGPub 2004/0022536)** and in view of **Blahut (US Patent # 6,778,550)** and further in view of **Suzuki et al. (US PGPub 2005/0259541)** and in further view of **Chang (US PGPub 2003/0020991)**.

**Consider claim 16, and as applied to claim 13 above**, Koh et al. as modified by Blahut and further modified by Suzuki et al. disclosed the invention as described above; except for, the time-division-multiplexed broadcast/image signal includes time-slots for broadcast/image signals

corresponding respectively to the plurality of ONTs, each of the time-slots including a predetermined number of sub-time-slots for accommodating the same predetermined number of broadcast/image signals.

In related art, Chang disclose, the time-division-multiplexed broadcast/image signal (read as, downstream data frame 1200; figure 12) includes time-slots (read as, fields 1012 to N012; figure 12) for broadcast/image signals corresponding respectively to the plurality of ONTs, each of the time-slots includung a predetermined number of sub-time-slots (read as, fields 1012A to 1012D) for accommodating the same predetermined number of broadcast/image signals (paragraphs 0057 and 0063-0064).

It would have been obvious for a person of ordinary skill in the art at the time of the invention to incorporate the teachings of Chang with Koh et al. as modified by Blahut. Since, Chang disclose a method for increasing bandwidth efficiency by performing automatic bandwidth adjustment.

11. **Claim 19** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Blahut (US Patent # 6,778,550)** and in view of **Koh et al. (US PGPub 2004/0022536)** and further in view of **Suzuki et al. (US PGPub 2005/0259541)** and further in view of **Hou et al. (US Patent # 6,324,184)** and further in view of **Mallya (US PGPub 2004/0114633)**.

**Consider claim 19**, and **as applied to claim 9 above**, Blahut as modified by Koh and Suzuki and further modified by Hou disclosed, wherein the broadcast/image sub-time-slot contains a broadcast/image signal selected by one of the ONTs corresponding to said time-slot's order (Hou, disclose a frame 320 includes a plurality of time slots 322-328, figure 3 column 4 lines 20-39; according to Blahut, broadcast data is transmitted using TDM and a framed

structure, abstract; thus, the frame structure of Hou can be use by Blahut for transmitted broadcast data using TDM, and the time slots 322-328 carries broadcast data to be transmitted). Blahut as modified by Koh and Suzuki and further modified by Hou fail to disclose said time-slot being filled with null data if there is no broadcast/image signal selected by the ONT.

The examiner take official notice, that it is well known in the art to fill un-use portion of a frame with stuff bits, in order to keep a fixed frame length. Also, Mallya teaches of padding an unused portion of the frame with a number of stuff bits (abstract, paragraphs 0004-0005, 0017).

It would have been obvious for a person of ordinary skill in the art at the time of the invention to incorporate the teachings of Mallya with Blahut as modified by Koh and Suzuki and further modified by Hou. Since, stuffing unused portion of a frame with bits keeps the frame length fixed, which is critical to the type of communication protocol.

### *Allowable Subject Matter*

12. **Claims 2, 4, 6-8, 10, 14 and 17-18** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### *Response to Arguments*

13. Applicant's arguments with respect to claims 1 and 13 have been considered but are moot in view of the new ground(s) of rejection.

On page 15, applicant argues, the combination of the reference would change the principle of the operation of Blahut's OLT from that transmits a downstream optical signal to the

ONU via a TDM scheme using one wavelength to that containing an OLT that transmits a plurality of downstream optical signal via WDM scheme using a plurality of wavelengths. At the same time, the combination of the references would change the principle of the operation of Koh's OLT from that transmits a plurality of downstream optical signals to the ONU via a WDM scheme using a plurality of wavelengths to that transmits a downstream optical signal via TDM scheme using one wavelength. The examiner respectfully disagrees, since Koh had clearly indicated that broadcast signal firstly gets TDM onto a single wavelength, via TDM 430 and E/O 462 (paragraphs 0039-0042). While WDM is perform on two different type of data, which are TDM broadcast signal and communication signal. Thus, the principle of operation of the OLT disclosed by OLT would not have been modified, because the TDM broadcast signal is not modified while getting transmitted to the ONUs; except for, additional communication signals are transmitted to the ONUs along with TDM broadcast signals. Therefore, the TDM broadcast signal is preserved by the use of a different wavelength than the communication signal.

***Conclusion***

14. Any response to this Office Action should be **faxed to** (571) 273-8300 **or mailed to**:

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

**Hand-delivered responses** should be brought to

Customer Service Window
Randolph Building
401 Dulany Street
Alexandria, VA 22314

15. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Thi Le whose telephone number is (571) 270-1104. The Examiner can normally be reached on Monday-Friday from 7:30am to 5:00pm.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Kenneth Vanderpuye can be reached on (571) 272-3078. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free) or 703-305-3028.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist/customer service whose telephone number is (571) 272-2600.

*Thi Le*

KENNETH VANDERPUYE
SUPERVISORY PATENT EXAMINER